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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/876,778	06/07/2001	Jan L. Clatty	Mo6418/MD-01-49-PU	8857
157	7590	11/01/2006	EXAMINER	
BAYER MATERIAL SCIENCE LLC			COONEY, JOHN M	
100 BAYER ROAD			ART UNIT	PAPER NUMBER
PITTSBURGH, PA 15205			1711	

DATE MAILED: 11/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.



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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 09/876,778  
Filing Date: June 07, 2001  
Appellant(s): CLATTY, JAN L.

**MAILED**  
NOV 01 2006  
**GROUP 1700**

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Lyndanne M. Whalen  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 8-18-06 appealing from the Office action  
mailed 2-6-06.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The following are the related appeals, interferences, and judicial proceedings known to the examiner which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal:

The Board's decision dated September 30, 2004 in the present application (Appeal No. 2004-2293 for Application No. 09/876,778).

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

No amendment after final has been filed.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

6,180,686                    KURTH                    1-2001

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurth (6,180,686).

Kurth discloses isocyanate-reactive compositions comprising blown soy oil, crosslinking agent, blowing agent, and catalysts in amounts encompassing of appellant's claims (see the entire document).

Kurth differs from appellant's claims in that it is directed to the avoidance of environmentally questionable and relatively expensive petrochemical based polyols. However, its disclosure is replete with recognition of the well known nature of the polyols being avoided including specifics of molecular weight and functionality preferences for the various conventional polyols which they discuss to be well studied

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(see column 1 line 67 – column 2 line 29) which well encompass the molecular weight and functionality values claimed by appellant. Accordingly, it would have been obvious for one having ordinary skill in the art to have utilized petrochemical based polyether based polyols disclosed/avoided by Kurth in accompaniment with blown soy oil for the purpose of imparting relative non-degradability to the products being produced therefrom in order to arrive at the products of applicant's claims with the expectation of success in the absence of a showing of new or unexpected results. All disclosures of the prior art, including unpreferred or auxiliary embodiments, must be considered in determining obviousness. *In re Mills*, 176 USPQ; *In re Lamberti*, 192 USPQ 278'; *In re Boe*, 148 USPQ 507.

Appellant's showing has been considered. However, showings of new or unexpected results which are commensurate in scope with the scope of the instant claims are not demonstrated in the affidavit evidence presented sufficient to overcome the instant rejection.

Rejection of claims 1-7 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-10 of U.S. Patent No. 6,649,667 has been overcome by appellants' properly filed Terminal Disclaimer received 4-6-06.

**(10) Response to Argument**

Appellant's arguments on appeal have been considered, but rejection is maintained for the reasons set forth above.

In the examiner's answer dated 5-4-04 examiner set forth the following arguments which were considered by the Board of Appeals in affirming examiner's rejection. They are maintained to be still applicable:

Appellant's arguments have been considered but rejection is maintained as the reference's disclosure taken in its completeness is seen to fairly suggest appellant's claimed invention as characterized by examiner. No additional reference is seen to be necessary to support examiner's position of obviousness because the reference is specific as to the materials being avoided. If one were not interested in obtaining the full ecological advantages associated with their preferred isocyanate reactive component, then they would have been *prima facie* motivated to use the recited other well-known conventional petrochemical isocyanate-reactive materials identified by Kurth for their property engineering effects described.

The rejection is maintained as being proper for all of the reasons set forth above and those set forth in the findings of the Board in their decision dated 9-30-06 affirming examiner's decision to reject claims 1-7 under 35 USC 103(a) over Kurth to be proper. No further arguments directed towards the propriety of examiner's rejection are seen to necessary because this matter has already been settled.

In response to the Board's decision, appellant has filed affidavit evidence in an attempt to overcome examiner's rejection.

Appellant's showing has been considered. However, showings of new or unexpected results which are commensurate in scope with the scope of the instant claims are not demonstrated in the affidavit evidence presented sufficient to overcome the instant rejection. When considering showings of results, the following must be considered in determining whether showings are commensurate in scope with the claims for which protection is being sought:

Evidence of superiority must pertain to the full extent of the subject matter being claimed. *In re Ackerman*, 170 USPQ 340; *In re Chupp*, 2 USPQ 2d 1437; *In re Murch* 175 USPQ 89; *Ex Parte A*, 17 USPQ 2d 1719; accordingly, it has been held that to overcome a reasonable case of *prima facie* obviousness a given claim must be commensurate in scope with any showing of unexpected results. *In re Greenfield*, 197 USPQ 227. Further, a limited showing of criticality is insufficient to support a broadly claimed range. *In re Lemlin*, 161 USPQ 288. See also *In re Kulling*, 14 USPQ 2d 1056.

In the instant case it held that appellant has not demonstrated the necessary degree of criticality in support of the scope of invention claimed.

It is agreed that appellant's evidence is sufficient in its comparative showings for component a.), c.), and e.). The polyol used as component a.) in appellant's comparative showings is based on the polyol of the prior art embodiment relied upon, and the showings do set forth a representative range of values which are commensurate in scope with the range of values set forth in the claims. For components c.) and e.), in the instant case, it is not seen that the particular selection of catalyst and chain extender or crosslinking agent is critical. These components appear to be functioning in their conventional manner, and a commensurate in scope

representation of these claim components is not seen to be required in appellant's showing of new or unexpected results.

However, appellant's showing of results is deficient as to claim component b.) in that a significantly limited representation of the isocyanate reactive-materials encompassed by appellant's claims are set forth in appellant's showing of results. Accordingly, for this claim element appellant's showings are not commensurate in scope with the scope of appellant's claims. In fact, almost all of appellant's comparative showings are based on blends of two particularly selected polyether polyols (example 17 being the exception in its use of one of the two particularly selected polyols) which are not representative of the array of isocyanate-reactive materials defined by component b.) of appellant's claim 1 or the array of polyether polyols defined by component b.) of appellant's claim 7. As appellant's invention is directed towards the selection of combinations of isocyanate-reactive materials for the purposes of their invention, it is seen necessary that in order to overcome examiner's position of obviousness the showings of new or unexpected results must be commensurate in scope with the scope of the claims on this claim element.

In that all of the showings of results are based on the selection of a very particularly selected polyol or blend of polyols in combination with the soy based polyol of appellant's claims that are extremely limited in their representation of the isocyanate-reactive materials or polyether polyols encompassed by component b.) of appellant's claims, it is seen that appellant's showing of new or unexpected results are not

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commensurate in scope with the scope of the claims as they currently stand. In fact, on considering the results set forth in appellant's affidavit, it appears that appellant's invention may just as likely reside in the selection of the polyols of component b.) for combination with the polyols of appellant's component a.) rather than the employment of the polyol of component a.) used in combination with any of the vast array of isocyanate-reactive materials or polyether polyols defined by component b.) of appellant's claims. As such it is held that appellant's have not set forth a clear and unequivocal showing of new or unexpected results attributable to the combinations of their claims which are commensurate in scope with the scope of their claims.

Additionally, as to component d.) of appellant's claims, it is noted that appellant's results fail to set forth a commensurate in scope showing of the blowing agents encompassed by appellant's claims. Appellant's comparative showing set forth only one species of a chemical blowing agent, water, which is not representative of the array of both chemical (reactive) and physical (non-reactive) blowing agents included within the scope of appellant's claims. As these materials have varied effects and compatibilities with reactive materials, especially, between classes of blowing agents, it is not seen that appellant's employment of only one blowing agent, water, in its comparative showings is sufficient in setting forth a showing of new or unexpected results commensurate in scope with the scope of appellant's claims. This argument does not apply to claim 7 which is directed towards the use of water as component d.) rather than blowing agents of any kind.

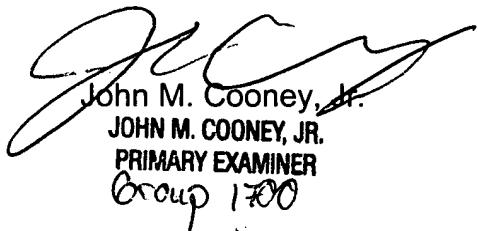
Examiner holds and maintains that appellant's showing of results set forth in the affidavit received 3-7-05 fails to set forth the necessary unequivocal showing of new or unexpected results which are commensurate in scope with the scope of the claims as they currently stand that is required in order to overcome the rejection properly set forth and maintained above..

**(11) Related Proceeding(s) Appendix**

Copies of the court or Board decision(s) identified in the Related Appeals and Interferences section of this examiner's answer are provided herein.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,



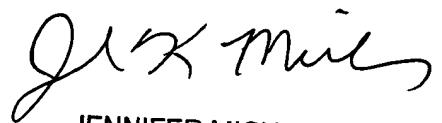
John M. Cooney, Jr.  
JOHN M. COONEY, JR.  
PRIMARY EXAMINER  
Group 1700

Conferees:



James Seidleck

Jennifer Kolb-Michener



JENNIFER MICHENER  
QUALITY ASSURANCE SPECIALIST



106418

The opinion in support of the decision being entered today was not written for publication and  
is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

**MAILED**

SEP 30 2004

U.S. PATENT AND TRADEMARK OFFICE  
BOARD OF PATENT APPEALS  
AND INTERFERENCES

*Ex parte JAN L. CLATTY*

Appeal No. 2004-2293  
Application No. 09/876,778

ON BRIEF

RECD BY RT 10/6/04  
ATE 11/30/04 Request for  
Reconsideration/Refile  
APPROVED

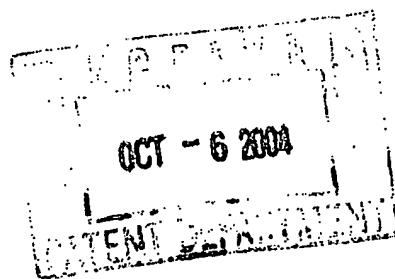
Before OWENS, KRATZ, and TIMM, *Administrative Patent Judges*.

TIMM, *Administrative Patent Judge*.

**DECISION ON APPEAL**

This appeal involves claims 1-7, which are all of the claims pending in this application.

We have jurisdiction over the appeal pursuant to 35 U.S.C. § 134.



### ***INTRODUCTION***

Claims 1-7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 6,180,686 B1 issued to Kurth on January 30, 2001 (Kurth).<sup>1</sup> Appellant states that the claims stand or fall together (Brief, p. 3). We select claim 1 to represent the issues on appeal.

Claim 1 reads as follows:

1. An isocyanate-reactive component useful for the production of a rigid closed cell polyurethane foam by a RIM process comprising:
  - a) from 0.5 to 30% by weight, based on total weight of isocyanate-reactive component, of a polyol based on vegetable oil, fish oil or oil derived from animal fat,
  - b) from 5 to 80% by weight, based on total weight of isocyanate-reactive component, of an isocyanate-reactive material which is different from a) having a functionality of at least 1 and a number average molecular weight of from 400 to 10,000,
  - c) a chain extender or a crosslinking agent,
  - d) a blowing agent, and
  - e) a catalyst.

We affirm and in so doing we adopt the Examiner's well stated findings of fact and conclusions of law as our own. We add the following for emphasis.

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<sup>1</sup>The rejection of claims 1-7 under 35 U.S.C. § 102(b) as anticipated by WO 00/234,491 has been withdrawn by the Examiner (Answer, p. 3).

***OPINION***

There is no question here that Kurth suggests formulating a composition including a polyol based on vegetable oil as required by part a) of claim 1 along with ingredients meeting parts c) through e) of the claim. The question is whether Kurth fairly suggests the additional inclusion of an ingredient meeting part b) of the claim in the concentration further required by the claim.

The Examiner's rejection is based upon the fact that Kurth describes a isocyanate-reactive component including blown soy oil, crosslinking agent, blowing agent, and catalyst as required by claim 1, parts a) and parts c) through e). It is further based upon the fact that Kurth also provides evidence that, conventionally, such isocyanate-reactive compositions were formulated with petroleum-based polyols of the type required by part b) of claim 1. Kurth seeks to replace those conventional polyols with vegetable oil based polyols and describes doing so in toto. However, we agree with the Examiner that once one of ordinary skill in this art understood that vegetable oil based polyols as well as petroleum-based polyols are useful for formulating isocyanate-reactive compositions, the use of the two types of polyols together would have been obvious. When the prior art teaches several compositions useful for the same purpose, it is *prima facie* obvious to combine two or more of those compositions for use for the very same purpose.

*In re Kerkhoven*, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980).

Appellant argues that there is no motivation to include petroleum-based polyols along with the vegetable oil based polyols because Kurth teaches avoidance of the petroleum-based polyols. We agree that there is no express suggestion of making the combination in Kurth. But such an express suggestion is not required to establish a *prima facie* case of obviousness. Instead, it "may come from the prior art, as filtered through the knowledge of one skilled in the art." *Motorola, Inc. v. Interdigital Tech. Corp.*, 121 F.3d 1461, 1472, 43 USPQ2d 1481, 1489 (Fed. Cir. 1997); see also *Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc.*, 75 F.3d 1568, 1573, 37 USPQ2d 1626, 1630 (Fed. Cir. 1996). One of ordinary skill in the art would take known property and economic considerations into account in selecting the polyol or combination of polyols to use. Kurth indicates that the selection of polyol does not dramatically impact either the processing or the qualities of the end product (Kurth, col. 4, ll. 14-20). Economic factors alone can provide motivation to make a modification. *In re Thompson*, 545 F.2d 1290, 1294, 192 USPQ 275, 276-77 (CCPA 1976). Moreover, selection may hinge on availability of reactants as well. We find that there is sufficient factual evidence to support the Examiner's finding of a suggestion to use both types of polyols in the composition of Kurth.

Appellant argues that one of ordinary skill in the art would not know how much of the petroleum-based polyol to include (reply Brief, pp. 2-3). We cannot agree. Under the facts of this case, the concentration would be determinable through routine experimentation. The evidence indicates that useful products can be obtained at a wide range of concentrations. See

Kurth at column 4, lines 17-20 which states that “[t]he qualities of the final flexible or semi-rigid urethane foam produced using the vegetable oil are consistent with those produced using high grade, expensive [petroleum-based] polyol.” In such a situation, the burden is on the applicant to establish non-obviousness through unexpected results or other evidence of secondary considerations. See *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990); *In re Ranier*, 377 F.2d 1006, 1010, 153 USPQ 802, 805 (CCPA); *In re Bourden*, 240 F.2d 358, 361, 112 USPQ 323, 325 (CCPA 1957); *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

As a final point, we note that Appellants base no arguments upon objective evidence of non-obviousness such as unexpected results. We conclude that the Examiner has established a *prima facie* case of obviousness with respect to the subject matter of claims 1-7 which has not been sufficiently rebutted by Appellants.

### ***CONCLUSION***

To summarize, the decision of the Examiner to reject claims 1-7 under 35 U.S.C. § 103(a) is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

*Terry J. Owens*  
**TERRY J. OWENS**  
Administrative Patent Judge

**PETER F. KRATZ**  
Administrative Patent Judge

*Catherine Timm*  
CATHERINE TIMM  
Administrative Patent Judge

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Appeal No. 2004-2293  
Application No. 09/876,778

Page 7

Patent Department  
Bayer Corporation  
100 Bayer Road  
Pittsburgh, PA 15205-9741



PATENT APPLICATION  
Mo 6418  
MD 01-49-PU

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

APPLICATION OF

JAN L. CLATTY

SERIAL NUMBER: 09/876,778

FILED: JUNE 7, 2001

TITLE: POLYURETHANE FOAMS HAVING  
IMPROVED HEAT SAG AND A  
PROCESS FOR THEIR  
PRODUCTION

)  
) GROUP ART UNIT: 1711  
) EXAMINER: JOHN M. COONEY  
)  
)  
)  
)  
)  
)  
)

**DECLARATION UNDER 37 CFR 1.132**

I, Jan L. Clatty of 909 Tottenham Drive, Moon Township, PA 15108 declare as follows:

1. I studied Chemistry at Penn State University and obtained a Bachelor of Science degree in 1984. Since 1986 I have been employed by Bayer MaterialScience LLC and its predecessor companies in Pittsburgh, PA to do research and development work in the area of polyurethane foams and elastomers. My current position is Principal Scientist in the Polyurethanes RIM Elastomers and Foams Department.
2. I am the inventor of the subject matter being claimed in the above-identified United States patent application.
3. I have read and am familiar with the disclosures made in WO 00/23491 and in U.S. Patent 6,180,686 which have been cited against the claims pending in the above-identified application.

4. In order to demonstrate that the invention claimed in the above-identified application is significantly different from the developments disclosed in WO 00/23491 and in U.S. Patent 6,180,686, I performed or supervised the experiments described below.

### EXPERIMENTS

The following starting materials were used in these Experiments:

SOY A            a polymerized soybean oil having a hydroxyl functionality of 1.8, a hydroxyl number of 51.8 and an equivalent weight of 1100 which is commercially available under the name SoyOyl P38.05 (low odor) from Urethane Soy Systems Co., Inc.

SOY B            a polymerized soybean oil having a hydroxyl functionality of 3, a hydroxyl number of 174 and an equivalent weight of 322 which is commercially available under the name SoyOyl P38.GC5 from Urethane Soy Systems Co., Inc.

SOY C            a polymerized soybean oil having a hydroxyl functionality of 3.4, a hydroxyl number of 65.8 and an equivalent weight of 850 which is commercially available under the name SoyOyl P56.05 from Urethane Soy Systems Co., Inc.

POLYOL A        Glycerol-started polyether of propylene oxide having a functionality of 3 and a hydroxyl number of 1050 (molecular weight about 160)

POLYOL B        A glycerol-started polyether of propylene oxide and ethylene oxide (83 wt.% propylene oxide and 17 wt.% ethylene oxide) having a hydroxyl number of 28 and a functionality of 3.

DC 193            Silicone surfactant available as Dow Corning 193 from Dow Corning Corporation.

PU-1748          A quaternary ammonium salt of the amide of tall oil and N,N'-dimethyl-1,3-diamine propane.

ISO

modified diphenylmethane diisocyanate having an NCO content of 27% by weight which is commercially available from Bayer MaterialScience LLC under the name Mondur 486.

General Procedure:

An isocyanate-reactive component composed of the materials listed in TABLE A or TABLE B in the amounts indicated in parts by weight in TABLE A or TABLE B was prepared. This isocyanate-reactive component was then reacted with ISO in an amount such that the Isocyanate Index was 110. The ISO and isocyanate-reactive component were mixed using an air mixer and hand cast or poured into an aluminum lab mold. The Flex Modulus and Heat Distortion Temperature of the molded articles are graphically presented in either Exhibit A (Experiments 1-13) or Exhibit B (Experiments 1 and 14-17).

The Compression Strength, Flex Modulus and Heat Distortion Temperature for each polyurethane foam made are reported in TABLE A or TABLE B. The Flex Modulus and Heat Distortion Temperature of the rigid, closed-cell polyurethane foams made in these Experiments are plotted against the % Soy Polyol in the isocyanate-reactive component in either the attached Exhibit A or Exhibit B.

The Flex Modulus was determined in accordance with ASTM D 790 and is reported in Exhibits A and B in  $10^3$  psi and graphically presented in Exhibits A and B.

The Compression Strength was determined in accordance with ASTM D 695 @ 25% and is reported in psi in TABLES A and B.

Heat Distortion was determined in accordance with ASTM D 648 Temperature @ 66 psi and is reported in °C in TABLES A and B and graphically presented in Exhibits A and B.

Experiments 1-13

No soy-based polyol was included in the isocyanate-reactive component used in control Experiment 1.

In each of experiments 2-13, the isocyanate-reactive component did include one of three different soy-based polyols in the amount indicated in TABLE A. In each of these experiments, the soy-based polyol was simply added to the isocyanate-reactive component used in control Experiment 1. The amount of isocyanate used was adjusted to compensate for the increased amount of reactive hydroxyl groups and to maintain the NCO Index at 110.

TABLE A

Experiment/ Material	1*	2	3	4	5	6	7	8	9
SOY A (pbw)	0	0	0	0	0	0	0	0	0
SOY B (pbw)	0	0	0	0	0	1	5	10	30
SOY C (pbw)	0	1	5	10	30	0	0	0	0
POLYOL A (pbw)	55	55	55	55	55	55	55	55	55
POLYOL B (pbw)	45	45	45	45	45	45	45	45	45
DC 193 (pbw)	3	3	3	3	3	3	3	3	3
PU-1748 (pbw)	6	6	6	6	6	6	6	6	6
WATER (pbw)	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
% SOY <sup>1</sup>	0	1	4	8	21	1	4	8	21
HDT @ 66 psi (°C)	58	58	57	55	54	69	67	66	63
Compression Strength @ 25%	4474	4459	4533	4120	3930	5028	4883	4656	4203
Flex Modulus (10 <sup>3</sup> psi)	161	162	154	147	116	179	173	163	135

pbw = parts by weight

\* Comparative Experiment.

<sup>1</sup> % SOY - wt% of vegetable-based polyol present in isocyanate-reactive component

TABLE A (cont'd)

Experiment/ Material	10	11	12	13
SOY A (pbw)	1	5	10	30
SOY B (pbw)	0	0	0	0
SOY C (pbw)	0	0	0	0
POLYOL A (pbw)	55	55	55	55
POLYOL B (pbw)	45	45	45	45
DC 193 (pbw)	3	3	3	3
PU-1748 (pbw)	6	6	6	6
WATER (pbw)	0.7	0.7	0.7	0.7
% SOY <sup>1</sup>	1	4	8	21
HDT @ 66 psi (°C)	56	58	57	54
Compression Strength @ 25%	2269	4529	4218	3820
Flex Modulus (10 <sup>3</sup> psi)	161	155	157	110

pbw = parts by weight

<sup>1</sup>% SOY = wt% vegetable-based polyol in isocyanate-reactive component

As can be seen from TABLE A and Exhibit A, there were slight differences in Flex Modulus and Heat Distortion Temperature for the foams due to differences in the soy-based polyol. However, simply adding the soy-based polyol to the isocyanate-reactive component reduced the Flex Modulus of the polyurethane. The Heat Distortion Temperature of the polyurethanes made with the added soy-based polyol were comparable to or slightly better than the control.

#### Experiments 1 and 14-17

In Experiment 1, the control, no soy-based polyol was included in the isocyanate-reactive component.

In each of Experiments 14-17, the soy-based polyol (POLYOL A) was included in the isocyanate-reactive component in the amount indicated in TABLE B. In these Experiments, the soy-based polyol was used in substitution for a portion of POLYOL B (Experiments 14-16) or all of POLYOL B (Experiment 17) that had been used in control Experiment 1. The amount of isocyanate used remained relatively constant because the number of reactive hydroxyl groups in the isocyanate-reactive component remained relatively constant.

TABLE B

Experiment/ Material	1*	14	15	16	17*
SOY A (pbw)	0	15	25	35	45
SOY B (pbw)	0	0	0	0	0
SOY C (pbw)	0	0	0	0	0
POLYOL A (pbw)	55	55	55	55	55
POLYOL B (pbw)	45	30	20	10	0
DC 193 (pbw)	3	3	3	3	3
PU-1748 (pbw)	6	6	6	6	6
WATER (pbw)	0.7	0.7	0.7	0.7	0.7
% SOY <sup>1</sup>	0	13	21	30	38
HDT @ 66 psi (°C)	58	68	73	74	64
Compression Strength @ 25%	4474	4478	4583	4485	4359
Flex Modulus (10 <sup>3</sup> psi)	161	178	175	171	150

pbw = parts by weight

\* Comparative Example

<sup>1</sup>% SOY = wt% vegetable-based polyol in isocyanate-reactive mixture

As can be seen from TABLE B and Exhibit B, the Flex Modulus of the polyurethanes made with the soy-based polyol was higher than that of the control for each foam with the exception of the foam produced with an isocyanate-reactive component containing 38% soy-based polyol. Similarly, the Heat Distortion Temperature for the foams made with 13 wt%, 21 wt% and 30 wt% (based on total weight of isocyanate-reactive component) of the soy-based polyol was higher than that of the control (Experiment 1) and the foam made with an isocyanate-reactive component that included 38 wt% soy-based polyol (Experiment 17).

The improved Heat Distortion Temperature and Flex Modulus properties achieved when up to 30 wt% of the isocyanate-reactive component was a vegetable-based polyol could not have been expected from the teachings of either U.S. 6,180,686 or WO 00/23491.

## 5. CONCLUSIONS

As can be seen from the data presented in TABLE A and Exhibit A, just adding a vegetable-based polyol to a typical polyurethane-forming reaction mixture did not significantly improve the properties of the polyurethane.

It can be seen from the data presented in TABLE B and Exhibit B, that when a vegetable-derived polyol was used as a substitute for a portion of a polyether polyol of the type which is typically used in such formulations, polyurethanes having improved properties were obtained. More specifically, when a soy-based polyol is used in an amount greater than 0 and less than or equal to 30 wt%, polyurethanes characterized by higher Flex Moduli and Heat Distortion Temperatures than (a) the control in which no vegetable oil-derived polyol was used and (b) compositions in which greater than 30 wt% soy-based polyol was used were produced.

There is no teaching in either WO 00/23491 or U.S. Patent 6,180,686 which would lead one skilled in the art to expect such results.

6. The undersigned declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing therefrom.

Further Declarant Sayeth Not.

Signed at Pittsburgh, Pennsylvania, this 3<sup>rd</sup> day of MARCH, 2005.

Jan L. Clatty  
Jan L. Clatty

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